Sarbjot Mann
CMPT 125, Assignment 3

1. The Fibonacci sequence is given by 1, 1, 2, 3, 5, 8, 13, 21, ... The first two numbers are 1, and subsequent numbers are the sum of the previous two. If Fib(k) represents the kth number in the sequence, then we have Fib(1) = Fib(2) = 1, and Fib(k) = Fib(k-1) + Fib(k-2) for k > 2.

   a. Given the code segment, the call stack should look as follows, if the code is as follows:

```
int Fib(int k) {
  if (k <= 2) {
    return 1;
  }
  return Fib(k-1) + Fib(k-2);
}

int main() {
  int m = 4;
  int n = Fib(m);
  return 0;
}
```

The code will run as follows:
fib(4)
 fib(3)
  fib(2)
  fib(1)
 fib(2)

The first fib(4) will run but then it'll call fib(3) before fib(2) so after fib(3) is finished running (it'll rul fib(2) and fib(1)) then fib(2) which is from the original fib(4) will run.

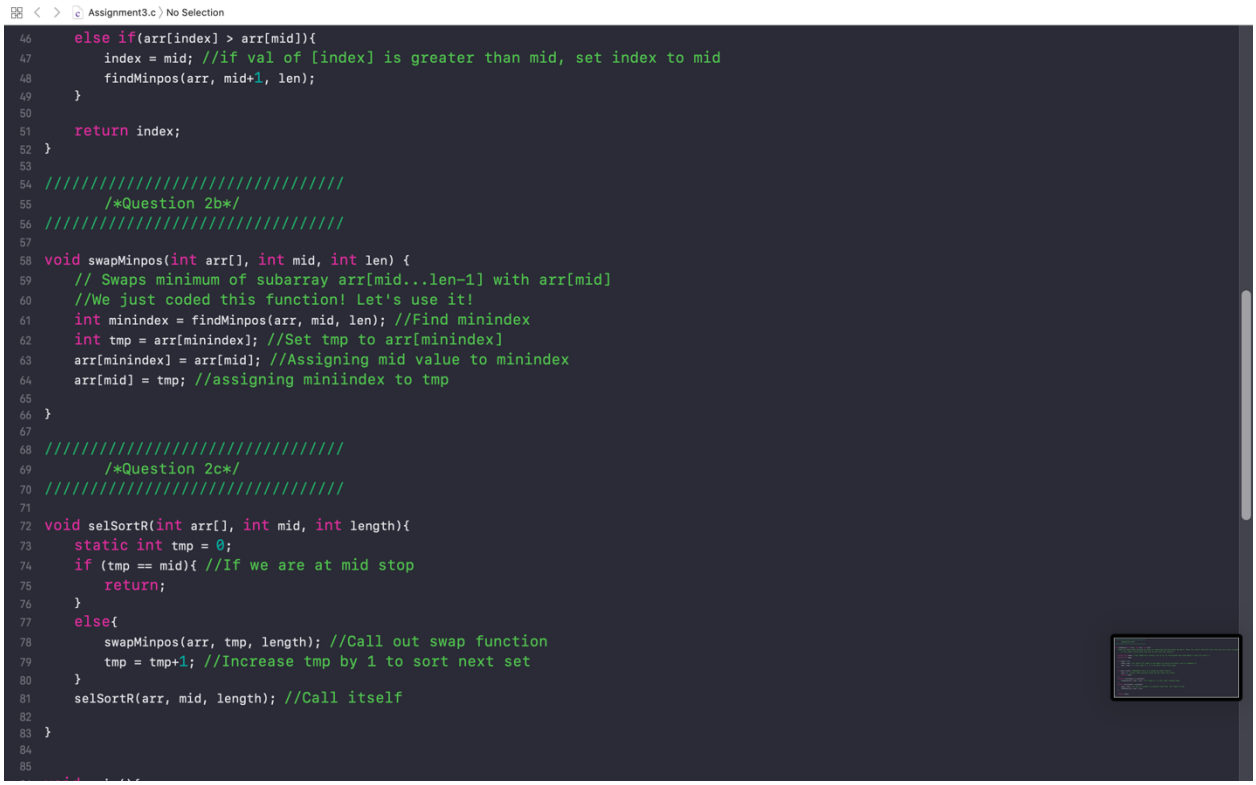
Call Stack	**Last Func Call if app,**	**Last Func Return, if app**	**Function parametres**	**Func return value if app**
Main m = 4 n = ?	Main	N/A	N/A	N/A
Fib k = 4 Main m = 4 n = ?	Fib	N/A	k = 4	N/A
Fib k = 3 Fib k = 4 Main m = 4 n = ?	Fib	Fib(4)	k=3	N/A
Fib k = 2 Fib k = 4 Main m = 4 n = ?	Fib	Fib(3)	k=2	1
Fib k = 1 Fib k = 4 Main m = 4 n = ?	Fib	Fib(3)	k=1	1
Fib k = 2 Main m = 4 n = ?	N/A	Fib(4)	2	1
Main m = 4 n = 3	N/A	Fib	N/A	3

b.

```c
#include <stdio.h>

////////////////////////////////
          /*Question 1b*/
////////////////////////////////


int FibIter(int k) {
    int n1 = 1;
    int n2 = 1;
    int n3 = 1; //if the user doesn't enter <= 2, return n3 as beign 1
    for (int i = 2; i < k; i++){
        n3 = n1+n2; //adding two previous numbers
        n1 = n2; //set n1 to n2
        n2 = n3; //set n2 to n3
    }
    return n3;
}
```

2.

```c
////////////////////////////////
      /*Question 2a*/
////////////////////////////////

int findMinpos(int arr[], int mid, int len){
   /*Set up temp index because we keep on comparing mid and mid+1 we won't "Save the value" and will have the last min value instead
      of the least value which may not be the last min value*/

   static int index; //let index be a static int so it is intialized once and doesn't lose its value :)
   static int temp;

   if (temp == 0){
       index = mid; //to start off index to be equal to mid so we have a val to compare to
       temp = temp + 1; //set temp to + 1 so we dont enter here again
   }

   if (mid == len){ //Remember that in a array we count from 0
       temp = 0; //reset temp counter since we may need this after
       return index;
   }
   else if (arr[index] <= arr[mid]){
       findMinpos(arr, mid+1, len); //if index is <= mid, dont change index
   }
   else if(arr[index] > arr[mid]){
       index = mid; //if val of [index] is greater than mid, set index to mid
       findMinpos(arr, mid+1, len);
   }

   return index;
}
```



Note: Full testing code, and main function on .c file.